International Ultraviolet Explorer
Final Archive
Contract NAS5-97042

Monthly Progress Report

November 1996

Computer Sciences Corporation

System Sciences Division

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Major Offices and Facilities Throughout the World

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International Ultraviolet Explorer Final Archive
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1. Work Accomplished

a. Final Archive Processing

CSC continued to process IUE images through the Final Archive Data Processing System. Raw images were obtained primarily from NDADS using the FSTAGE system. Input parameters were obtained from the IUE database.

IPC staff resolved outstanding questions for database entries for 485 images. Most of these questions involved homogeneous data and camera temperatures. Many of these images were then queued for processing.

CSC placed high priority on processing SWP high-dispersion images through the NEWSIPS system on the LASP Alpha cluster. A total of 3414 images were successfully processed, verified, and delivered for archiving. Along with the data, 23 BOLs were sent to the IUE Archive Support staff.

Low-dispersion images were processed on the DECstations as questions about their database entries or raw data were resolved. IPC staff processed 60 LWP low-dispersion and 119 SWP low-dispersion images. The data were delivered to IUE Archive Support staff, along with 3 BOLs.

Software for handling partial-read images was tested and implemented as Release 2.4.5 on the DECstations. Full compatibility tests were performed to ensure the accuracy of the software delivery.

The IPC shipped 65 DAT tapes containing NEWSIPS-processed low-dispersion data to VILSPA.

b. Calibration

CSC has been working to refine the wavelength calibration for LWR high-dispersion data processed with LWR ITF B. In general, the wavelength solutions for LWR ITF B have been less well behaved than those for LWR ITF A. Further analysis will be required to quantify the signal-to-noise gains realized with ITF B in high dispersion and to characterize the ITF B high-

dispersion wavelength calibration before a final decision to utilize ITF B for LWR high-dispersion production is reached.

CSC derived the LWR Trailed-to-Large and Large-to-Small Aperture low-dispersion absolute-calibration correction ratios for ITF B. In addition, calibration staff performed VMS-to-Ultrix (Prototype-to-Configured) low-dispersion compatibility testing for the LWR ITF B software system. Using the verified Ultrix (MIDAS) system, CSC then processed the LWR ITF B low-dispersion absolute-calibration dataset (some 200 images) and delivered it to VILSPA both electronically and on tape. CSC also processed three-quarters of the roughly 400 low-dispersion images that will be used to derive the sensitivity-degradation correction for LWR ITF B.

Calibration staff determined the LWR large- and small-aperture areas (as projected on the camera faceplate) using high-dispersion WAVECALs, and updated the determination of these parameters for SWP and LWP using the latest value for the camera plate scales relating pixels to arcseconds.

For the LWP camera, CSC had previously made available the processed high-dispersion images that will be used by VILSPA to derive the LWP ripple and absolute calibration. At VILSPA's request and with the concurrence of the COTR, CSC converted the dataset to ASCII format and redelivered the data to VILSPA both electronically and on tape.

The calibration staff investigated two calibration issues raised by Guest Observers. The first involves an apparent problem with undesirable spectral signatures imposed by the low-dispersion absolute calibrations as derived by VILSPA, particularly in the LWP camera. CSC performed analyses to eliminate the sensitivity-degradation correction as a source of this error and reviewed materials sent by VILSPA explaining the details of the procedure used to develop the absolute calibration. The unwanted spectral signature appears to be related to inherent residual camera non-linearities and the piecewise (in wavelength space) fashion in which VILSPA combined the 100-percent and 200-percent exposures of white dwarf calibration stars and other standard stars. VILSPA is continuing to review the issue and will address the possibility of correcting for it after the LWR low-dispersion absolute calibration has been derived.

The second issue raised by Guest Observers is an apparent inaccuracy in the extrapolation of the low-dispersion sensitivity degradation correction in the SWP camera to dates beyond the end of the determining dataset (early 1995). Empirical trends for recent data do not appear to follow the extrapolated values as closely as desired, and CSC has begun assembling data on any later monitoring observations to examine whether an improved correction can be derived for 1995 and 1996 data.

CSC implemented the NEWSIPS C2.5.1 LWR low-dispersion capability to choose between two LWR ITF files (A and B) according to cross-correlation results on the SPHINX node. At the

present time the software is undergoing regression testing to ensure that it can also handle the processing of SWP and LWP low-dispersion images.

The software staff successfully implemented NEWSIPS high-dispersion Systems 3.1 (SWP Ultrix) and 3.2 (SWP and LWP Ultrix) on MINOTAUR and delivered these systems to VILSPA. Support is being provided to VILSPA in achieving compatibility with the MINOTAUR system. Additionally, CSC implemented NEWSIPS System 3.2_A (SWP and LWP Alpha version) on GORGON.

Implementation of the LWR BASISMOD Release 7 prototype code into the NEWSIPS 3.3_A (SWP, LWP, and LWR) MIDAS environment is in progress on GORGON. Also, updates to the Order Registration and DETIMG programs (in module RAWSCREEN) to handle LWR high-dispersion images have been incorporated into the NEWSIPS 3.3_A environment on GORGON. The software staff completed FAMRs 703, 731, and 733 and delivered them to IPC.

c. Data Archiving Support

IUE archive support services were provided using the NDADS systems. Twenty-three electronic data deliveries (20425 files, 4085 images) were received from the GSFC Final Processing system. Twenty of those deliveries (17330 files, 3466 images) were ingested onto optical disk platter and are available to the public. The small backlog was caused by NDADS hardware problems and will be eliminated during the next month. In addition, two deliveries of VILSPA 19th episode NEWSIPS data (970 files, 194 images) were archived and 3 deliveries of VILSPA 19th episode IUESIPS data (225 files, 157 images) were archived. An inventory of all the IUESIPS Master tapes was begun to verify the contents of the existing tapes. Several tapes were found to have different file contents than indicated by the original records. The problems vary from different file orders to different file contents, and each set of problems will be resolved in the appropriate manner.

d. IUE Data Analysis Center (IUEDAC) Operation

Special assistance was provided to twelve users this month and remote user accounts were maintained for 32 users. The IUE merged log and the Copernicus catalog were updated. Software registration forms were received from two new remote sites. The IUE electronic newsletter was distributed monthly. Routine backups and system maintenance were performed for nodes IUEWWW, KLUGE, VACUUM, and VOID. One routine was added to the experimental library.

e. Computer Systems Operation and Maintenance

As a result of changes in project staff, systems personnel redistributed computer equipment to maximize overall productivity. System maintenance and troubleshooting efforts continued.

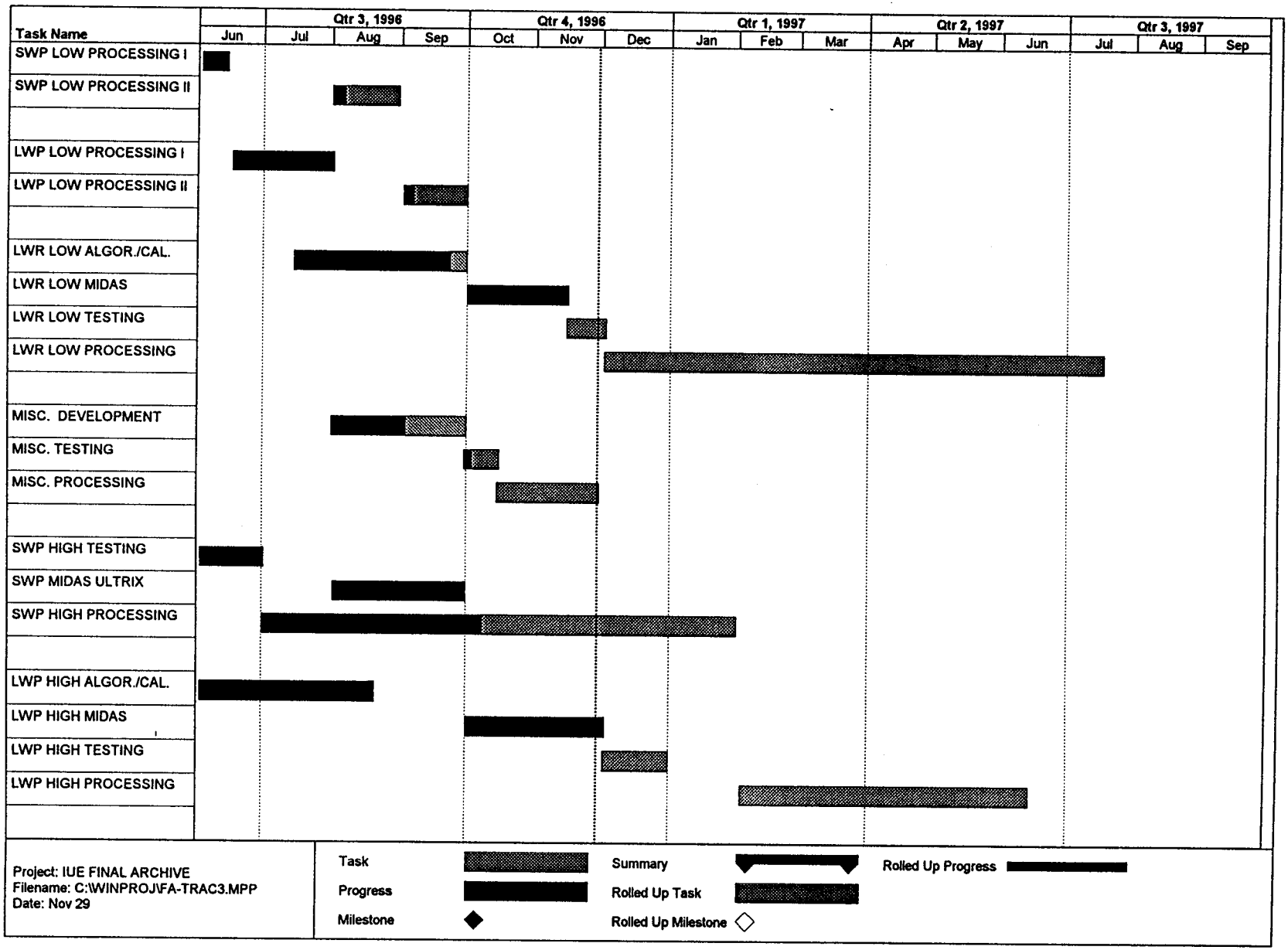
f. Management and Administration

On a weekly basis CSC project management collected quantitative measurements of progress in Final Archive development and processing activities, entered the data into automated spreadsheets, and displayed the data for project and NASA use. The development Gantt chart and processing-statistics histogram included here reflect the status of project work in these areas as of the end of the November reporting period. Highlights of the information represented in these charts are that the SWP and LWP high-dispersion Ultrix processing systems have been completed and delivered to VILSPA, the LWR low-dispersion Ultrix processing system is complete except for final regression and acceptance testing, and the SWP high-dispersion processing of GSFC data has reached the 45.7% completion mark.

CSC project management coordinated the attendance and reporting by technical staff at weekly IUE Final Archive project meetings with the NASA COTR. CSC management continued close interaction with project technical staff on a daily basis to supervise activities, assess the adherence to work plans and standards and the achievement of objectives and milestones, set priorities, maintain and balance resources, and identify and address any potential or actual problems.

CSC project management established the mechanisms and procedures needed to fulfill the reporting requirements of the contract, including this initial monthly progress report. Schedules for all remaining reports required by the contract were prepared.

As part of its ongoing program to maintain an experienced staff as the project winds down, CSC project management met with managers from other CSC areas to discuss future placement of current project staff. This activity is critical to ensuring that these personnel remain on the job until their activities are completed. As a result of these discussions, placement of a key project calibration staff member in another CSC position in the spring 1997 timeframe has been assured. In addition, project management placed a senior staff member elsewhere within the Science Programs organization when his IUE support ended, and thus he is available for consultation as needed, which would not have been assured had he left CSC. CSC project management also arranged for computer systems personnel to help out on other projects through part time/temporary assignments. This helps the employees build new skills toward the day when their role on IUE ends. Experience has shown that in addition to actually making the employee easier to place, this reassures the employee that he or she is moving forward and will be "marketable"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SWP LOW PROCESSING I
SWP LOW PROCESSING II
LWP LOW PROCESSING I
LWP LOW PROCESSING II
LWR LOW ALGOR./CAL.
LWR LOW MIDAS
LWR LOW TESTING
LWR LOW PROCESSING
MISC. DEVELOPMENT
MISC. TESTING
MISC. PROCESSING
SWP HIGH TESTING
SWP MIDAS ULTRIX
SWP HIGH PROCESSING
LWP HIGH ALGOR./CAL.
LWP HIGH MIDAS
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Project: IUE FINAL ARCHIVE
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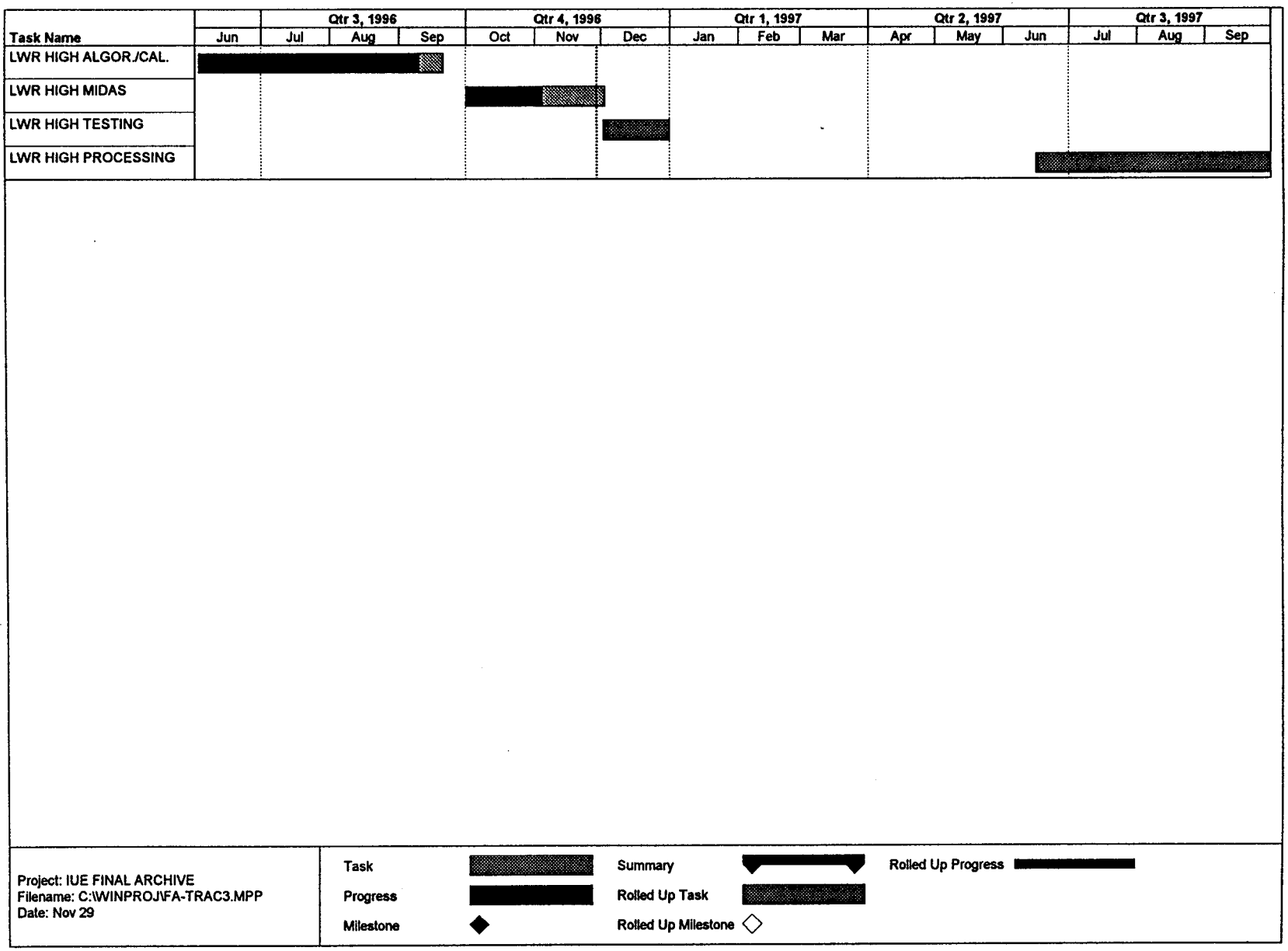
Summary
Rolled Up Task
Rolled Up Milestone
Rolled Up Progress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LWR HIGH ALGOR./CAL.
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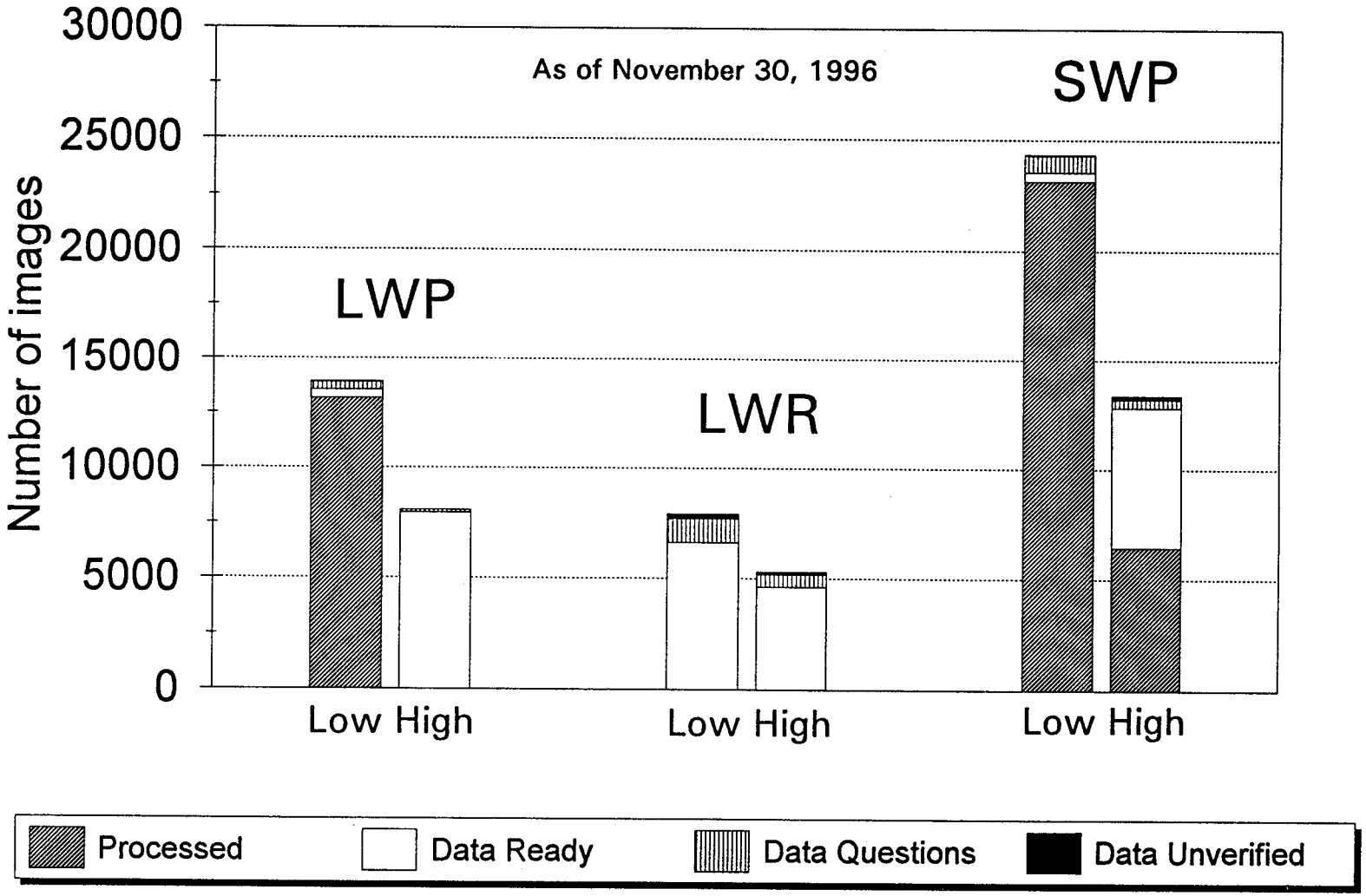
NASA IUE Final Archive Processing



when the time comes, making it less likely the employee will leave the project prematurely.

CSC project management coordinated the reallocation of hardware resources among project personnel in order to provide dedicated access to the MINOTAUR node by software development staff. This allowed the successful completion of the Ultrix versions of the high-dispersion processing systems for the SWP and LWP cameras. In the case of LWP, the system was delivered to VILSPA 2 weeks ahead of the December 1 target delivery date set last August.

2. Problem Areas

Hardware problems with the NDADS optical disk jukeboxes have caused problems for the CSC IUE archive support staff with both data ingest and data distribution activities. Unless these problems are corrected by the NDADS staff, CSC activities in this area will continue to be adversely affected.

3. Work To Be Performed

The IPC will continue routine data processing and verification operations. CSC will complete the testing of the LWR low-dispersion processing system, further investigate the outstanding questions regarding the use of ITF B for LWR high dispersion, and analyze ways of improving the SWP sensitivity-degradation correction for the 1995-1996 era. CSC will continue to archive IUE Final Archive data as it is delivered. IUEDAC support and assistance for IUE archive users will continue, and IUEDAC software will be updated to support high-dispersion final archive data. CSC will continue to provide ongoing computer system operation and maintenance and will provide project management functions including progress measurement and reporting, resource allocation, and work supervision.

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This report is the November 1996 Monthly Progress Report for the International Ultraviolet Explorer (IUE) Final Archive contract. The ultimate objective of this contract is the completion of the archival reprocessing of all IUE data obtained at GSFC between 1978 and 1995.

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14. SUBJECT TERMS
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